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Dominion

May 17, 2005

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Serial No. 05-237
NLOS/PRW R1
Docket Nos. 50-336/423
50-338/339
50-280/281
License Nos. DPR-65/NPF-49
NPF-4/7
DPR-32/37

DOMINION NUCLEAR CONNECTICUT, INC.
VIRGINIA ELECTRIC AND POWER COMPANY
MILLSTONE POWER STATION UNITS 2 AND 3
NORTH ANNA POWER STATION UNITS 1 AND 2
SURRY POWER STATION UNITS 1 AND 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS

In a letter dated August 7, 2003, Dominion Nuclear Connecticut, Inc. and Virginia Electric and Power Company (Dominion) provided the 60-day response to Bulletin 2003-01 for Millstone Power Station Units 2 and 3, North Anna Power Station Units 1 and 2 and Surry Power Station Units 1 and 2. The bulletin requested Dominion to either (1) state that the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the bulletin and are in compliance with all existing applicable regulatory requirements, or (2) describe any interim compensatory measures that have been implemented or that will be implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is complete.

In letters dated September 2, 2004, and September 14, 2004, the Nuclear Regulatory Commission (NRC) staff requested additional information to complete its review of Dominion's response to NRC Bulletin 2003-01. In a letter dated October 29, 2004, Dominion provided its response for Surry Power Station Units 1 and 2 and North Anna Power Station Units 1 and 2. In a letter dated November 10, 2004, Dominion provided its response for Millstone Power Station Units 2 and 3. In a letter dated March 31, 2005, the NRC staff further requested additional information to complete its review for North Anna Power Station Units 1 and 2 and Surry Power Station Units 1 and 2. In a letter dated April 8, 2005, the NRC further requested additional information to complete its review for Millstone

Power Station Units 2 and 3. Attachment 1 of this letter is the response to the request for additional information for North Anna Power Station Units 1 and 2 and Surry Power Station Units 1 and 2. Attachment 2 of this letter is the response to the request for additional information for Millstone Power Station Unit 2. Attachment 3 of this letter provides the response for Millstone Power Station Unit 3.

There are no commitments contained within this letter.

Should you have any further questions regarding this matter, please contact Mr. Paul R. Willoughby at (804) 273-3572.

Very truly yours,

Eugene S. Grecheck
Vice President – Nuclear Support Services
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Dominion Nuclear Connecticut, Inc.

Attachments (3)

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COMMONWEALTH OF VIRGINIA)
)
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The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President - Nuclear Support Services of Dominion Nuclear Connecticut, Inc. and Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 17th day of May, 2005.

My Commission Expires: August 31, 2008.

Margaret B. Bennett
Notary Public

(SEAL)

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
SURRY POWER STATION UNITS 1 AND 2

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS
NORTH ANNA POWER STATION UNITS 1 AND 2
SURRY POWER STATION UNITS 1 AND 2**

In a letter dated September 2, 2004, the Nuclear Regulatory Commission (NRC) staff requested additional information to complete its review of Dominion's response to NRC Bulletin 2003-01. In a letter dated October 29, 2004 Dominion provided its response for Surry Power Station Units 1 and 2 and North Anna Power Station Units 1 and 2. In a letter dated March 31, 2005, the NRC staff further requested additional information to complete its review for North Anna Power Station Units 1 and 2 and Surry Power Station Units 1 and 2. The response to the request for additional information for North Anna Power Station Units 1 and 2 and Surry Power Station Units 1 and 2 is provided below.

NRC Requested Information

In its response dated October 29, 2004, VEPCO provided the following information.

> The WOG recommendation was to implement the Sump Blockage Control Room Guideline (SBCRG) documented in Volume 2 to WCAP-16204, Revision 1 as an interim compensatory action to reduce the risk associated with sump blockage.

VEPCO's approach may be non-conservative in that it implies that the entirety of Volume I and Appendix A of Volume I to WCAP-16204, Revision 1, "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)" were not considered for its usefulness in further reducing risk from a sump clogging event. Although the 11 candidate operator actions (COAs) evaluated in Volume I of WCAP-16204, Revision 1 either may not be included in the SBCRG, may not be applicable to the North Anna or Surry plant designs, or may not be risk beneficial to North Anna or Surry, it is incumbent upon the licensee to provide technical justifications for not implementing them.

Therefore, VEPCO is requested to provide information that verifies the 11 COAs are included in the SBCRG. In addition, VEPCO is requested to provide a discussion on the plant-specific evaluations and verifications performed in order to justify the applicability and usability of the generic SBCRG for both North Anna and Surry. Finally, provide technical justification for any plant-specific deviations that do not implement any of the 11 COAs.

Dominion Response

In order to assure completeness in responding, the NRC request for additional information (RAI) has been divided into four separate parts. It is important to note that Surry Power Station (SPS) and North Anna Power Station (NAPS) are large dry subatmospheric containment designs with ECCS and containment heat removal systems that are specific to this type of containment. Thus, there are several non-trivial system differences compared to the Westinghouse reference plant that was used for the evaluations in Volume 1 of WCAP-16204, Revision 1.

NRC Question 1

VEPCO's approach may be non-responsive in that it implies that the entirety of Volume 1 and Appendix A of Volume 1 to WCAP-16204, Revision 1, "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)" were not considered for its usefulness in further reducing risk from a sump clogging event. Although the 11 candidate operator actions (COAs) evaluated in Volume 1 of WCAP-16204, Revision 1 either may not be included in the SBCRG, may not be applicable to the North Anna and Surry plant designs, or may not be risk beneficial to North Anna or Surry, it is incumbent upon the licensee to provide technical justifications for not implementing them.

Dominion Response

After Volumes 1 and 2 of WCAP-16204, Revision 1, were published, Dominion evaluated the applicability of both documents to North Anna Power Station (NAPS) and Surry Power Station (SPS). Volume 1 of the WCAP report documents the Westinghouse Owners Group (WOG) evaluation of 11 Candidate Operator Actions (COAs) for short-term implementation to reduce the risk from sump blockage. The participating utilities reviewed the COAs to determine if any warranted a generic recommendation for implementation in the short term. Some COAs apply only to a limited number of plants. Others require license amendments for implementation and were not considered short-term compensatory measures. Some could increase the potential for core damage and were not recommended for implementation. Volume 1 includes two recommendations in the Executive Summary that "should be implemented as generic ERG modifications": preparation for refill of the RWST and response to loss of recirculation flow. Both of these recommendations appear in the guidance that was provided in the generic Sump Blockage Control Room Guidance (SBCRG), which was provided in Volume 2 of WCAP-16204, Revision 1. The intent of the SBCRG was to realize the risk benefit that was described in LA-UR-02-7562, "The Impact of Recovery from Debris-Induced Loss of ECCS

Recirculation on PWR Core Damage Frequency," associated with recovery from loss of recirculation due to sump blockage.

As discussed in Dominion letter 04-556 dated October 29, 2004, in response to Bulletin 2003-01, Dominion promptly took appropriate actions to reduce the risk from sump blockage following a LOCA. Dominion developed enhancements to the SPS and NAPS Emergency Operating Procedures (EOPs) in parallel with the WOG activities and implemented plant-specific EOP changes in March 2004. When the WOG finalized the SBCRG and released it for use in March 2004, it was only necessary for Dominion to confirm that the SPS and NAPS plant-specific EOP changes were consistent with the SBCRG. In a letter dated October 29, 2004, Dominion confirmed that the NAPS and SPS EOPs had incorporated the seven major actions from the WOG SBCRG. Finally, as discussed in the response to NRC Question 4 below, Dominion has reviewed the eleven COAs and determined that none of the other COAs are appropriate as a short-term compensatory measure.

NRC Question 2

VEPCO is requested to provide information that verifies the 11 COAs are included in the SBCRG.

Dominion Response

The 11 Candidate Operator Actions in Volume 1 of WCAP-16204, Revision 1, are not included in the WOG SBCRG documented in Volume 2 of WCAP-16204, Revision 1. As discussed in the response to NRC Question 1, the WOG determined that only two COAs warranted generic guidance: preparation for refill of the RWST (COA A5) and response to loss of recirculation flow (COA A9). Both of these recommendations appear in the generic SBCRG. In addition, Volume 1 recommended in COA A8 that operator guidance be developed on symptoms and identification of sump blockage. NAPS and SPS implemented changes in March 2004 to EOP ES-1.3, "Transfer to Cold Leg Recirculation" to monitor key sump performance indicators for blockage, effectively implementing COA A8. The remaining COAs required plant-specific evaluations to assess the impact on the plant design and licensing basis. The analysis of each COA for SPS and NAPS is provided in Table 1.

NRC Question 3

VEPCO is requested to provide a discussion on the plant-specific evaluations and verifications performed in order to justify the applicability and usability of the generic SBCRG for both North Anna and Surry.

Dominion Response

As Dominion explained to the NRC in letter 04-556 dated October 29, 2004, SPS and NAPS did not implement the SBCRG as a stand-alone procedure. The SPS and NAPS EOPs were modified in March 2004 to provide the operators with recovery instructions for a loss of recirculation due to sump blockage. About the same time that the plant-specific EOP changes were implemented, the WOG published the SBCRG in Volume 2 of WCAP-16204, Revision 1. This document identified seven major actions to perform in response to loss of recirculation from containment sump clogging in a Westinghouse plant with a large dry containment. Dominion had monitored the development of the SBCRG to ensure that the March 2004 EOP changes implemented at SPS and NAPS would incorporate all seven major actions. Five of the seven major actions had been included already in SPS and NAPS procedure ECA-1.1, "Loss of Emergency Coolant Recirculation." The March 2004 EOP changes at NAPS and SPS added the remaining two major actions from the WOG SBCRG: 1) protect the safety injection and recirculation spray pumps; and, 2) establish and maintain optimum emergency coolant flow.

Dominion reviewed the SBCRG and concluded that the NAPS and SPS plant-specific EOPs have all of the essential functions and sequences in common with the SBCRG. Therefore, the intent of the SBCRG was completely implemented at SPS and NAPS before the SBCRG was fully available. The EOP changes were implemented using the plant procedure change process, which required plant-specific simulator validations and change justifications under 10 CFR 50.59. The plant-specific EOP changes did not change the progression of or operator response to any design basis accident. The EOPs provide streamlined instructions for operator monitoring of key sump performance parameters and a direct path to alternate core cooling if all emergency recirculation is lost.

NRC Question 4

Provide technical justification for any plant-specific deviations that do not implement any of the 11 COAs.

Dominion Response

Table 1 summarizes the Dominion evaluation of each COA from Volume 1 of WCAP-16204, Revision 1, for SPS and NAPS. Some of the COAs involve manually securing an operating containment spray or safety injection pump once it is established that all trains are running and other criteria are satisfied. NAPS and SPS did not implement pre-emptive measures for four reasons. First, this type of change has the potential for significantly increasing the risk of core damage and increasing the radiological dose to the public. It was judged that this negative impact outweighs any potential benefit in sump NPSH. Second, the SPS and NAPS licensing bases analyses assume that a minimum of one train of safety injection and one train of containment spray operate *continuously* to satisfy accident analysis acceptance criteria. Therefore, securing a safety injection or containment spray pump creates a new single failure that requires analysis and a potential licensing basis change. Interim compensatory measures should be short-term actions that are within a plant's licensing basis. Third, Dominion believes that such pre-emptive action deviates from the symptom-based response strategy of the EOPs and represents a change in procedure performance expectations for plant operators. Finally, the sump monitoring and recovery actions, implemented at NAPS and SPS in March 2004, provided sufficient risk reduction. Dominion concurs with the WOG that only COAs A5, A8, and A9 should be implemented as short-term compensatory measures.

Table 1: Evaluation of Westinghouse Owners Group Candidate Operator Actions from WCAP-16204, Revision 1, Volume 1		
Candidate Operator Action	**WOG Recommendation**	**Dominion Evaluation**
A1a-W Operator Action to Secure One Spray Pump	Implementation of this step is recommended for plants with containment fan coolers capable of removing significant heat loads.	This COA was not implemented. The NAPS and SPS containment fan coolers are non-safety related components located in the basement of the containment and will be flooded as the containment fills with water. The containment fan coolers would not be available to mitigate a LOCA inside containment. Also, continuous operation of the containment spray system is credited in the radiological analysis for the design basis LOCA. Since deliberate manual securing of one spray pump is not considered a "failure," analysis is required to show acceptable consequences with a failure of the remaining running spray pump. This interruption of spray flow could result in a significant increase in offsite dose while providing no appreciable delay in recirculation mode transfer. Thus, it was judged that the negative impact of the potential to significantly increase the radiological dose to the public outweighs any potential benefit in sump NPSH.
A1b-W Operator Action to Secure Both Spray Pumps	Implementation of this step is only recommended for plants with containment fan coolers that can remove 100% of the decay heat load when spray is stopped and spray is not required for iodine removal or pH control.	This COA was not implemented with the same technical basis as A1a-W.

Table 1: Evaluation of Westinghouse Owners Group Candidate Operator Actions from WCAP-16204, Revision 1, Volume 1		
Candidate Operator Action	**WOG Recommendation**	**Dominion Evaluation**
A2 Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation	Implementation of this operator action is recommended only for plants that: • Have margin in the sump NPSH calculation • Have the ability to secure one injection train • Have the ability to secure one or both spray pumps • Can refill RWST	This COA was not implemented because the low head safety injection (LHSI) pump NPSH margin was considered too small to support early switchover to sump recirculation.
A3-W Terminate One Train of Safety Injection After Recirculation Alignment	Plant specific evaluation	Deliberate manual securing of one SI train is not considered a "failure." Analysis is required to show acceptable consequences with a failure of the remaining running train after manually stopping one SI train. This would mean an interruption of SI flow until the operator can start a standby SI pump. This interruption of flow could result in a significant increase in peak clad temperature as shown in Appendix B of WCAP-16204, Revision 1, Volume 1. Thus, it is judged that the negative impact of increasing the likelihood of core damage and consequently increasing the radiological dose to the public outweighs the benefit in sump NPSH. This COA was not implemented.

Table 1: Evaluation of Westinghouse Owners Group Candidate Operator Actions from WCAP-16204, Revision 1, Volume 1		
Candidate Operator Action	**WOG Recommendation**	**Dominion Evaluation**
A4 Early Termination of one LPSI/RHR pump Prior to Recirculation Alignment	Analysis for CE plants only. Stopping one LPSI pump before recirculation may result in core damage and is not risk beneficial.	This COA was prepared for CE plants and was not applicable to SPS and NAPS, which are Westinghouse designed plants. NAPS and SPS did not implement any pre-emptive actions that could increase the probability of interrupting all SI flow.
A5 Refill of Refueling Water Storage Tank	Implementation of ERG changes to initiate early action to line up to refill the RWST or bypass it to support using an alternate makeup source, if needed, are generally recommended.	The NAPS and SPS EOPs include guidance to refill the RWST using borated sources.
A6 Inject More Than One RWST Volume from a Refilled RWST or by Bypassing the RWST	This action would only be taken after aligning for recirculation and a subsequent loss of recirculation capability due to sump blockage. This is clearly a beyond design basis situation. Therefore, these actions must be coordinated by the Technical Support Center and in accordance with the SAMGs (Severe Accident Management Guidelines).	The NAPS and SPS EOPs and SAMGs include operator guidance for using the opposite unit RWST as an alternate supply of core cooling. RWST cross-connect would be used only after a complete loss of recirculation (beyond the plant design basis). Recirculation cooling might be restored after sufficient water level exists to overcome the debris head loss on the sump screens. The SAMGs include steps to monitor containment water level for equipment flooding concerns.

Table 1: Evaluation of Westinghouse Owners Group Candidate Operator Actions from WCAP-16204, Revision 1, Volume 1

Candidate Operator Action	WOG Recommendation	Dominion Evaluation
A7 Provide More Aggressive Cooldown and Depressurization Following a Small Break LOCA	The recommendation was for CE plants. The Westinghouse ERGs already address maximizing the cooldown rate up to the Technical Specification limit.	The NAPS and SPS EOPs are consistent with the WOG ERGs and include guidance for aggressive cooldown and depressurization. No changes were necessary.
A8 Provide Guidance on Symptoms and Identification of Containment Sump Blockage	In general, the proposed change is advantageous to most plants.	The NAPS and SPS EOP changes that were implemented in March 2004 provide operators with multiple diverse indicators of containment sump blockage. Operator training addressed symptoms and identification of sump blockage. Thus, NAPS and SPS had implemented operator guidance in procedures about the time WCAP-16204, Revision 1, Volume 1 was published and therefore have appropriately incorporated this COA.
A9 - W Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation	Development of generic guidance to sump blockage in the form of Sump Blockage Control Room Guideline (Volume 2 to WCAP-16204, Revision 1).	The NAPS and SPS EOP changes that were implemented in March 2004 included the 7 major actions that are outlined in the SBCRG. Simulator scenarios of a loss of recirculation capability due to sump blockage were used with multiple operator teams to confirm the EOP changes. Thus, NAPS and SPS already had implemented sufficient contingency actions about the time the WOG SBCRG was published and therefore have appropriately incorporated this COA.
A10 Early Termination of One Train of HPSI/High-Head Injection Prior to Recirculation Alignment	Analysis for CE plants only.	This COA was prepared for CE plants and was not applicable to SPS and NAPS, which are Westinghouse plants. NAPS and SPS did not implement any pre-emptive actions that could increase the probability of interrupting all SI flow.

Table 1: Evaluation of Westinghouse Owners Group Candidate Operator Actions from WCAP-16204, Revision 1, Volume 1		
Candidate Operator Action	**WOG Recommendation**	**Dominion Evaluation**
A11 Prevent or Delay Containment Spray for Small Break LOCAs in Ice Condenser Plants	Implementation is not recommended as a change to the ERGs and no further generic work is required.	This COA is not applicable to SPS and NAPS, which have a large dry containment design.

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ATTACHMENT 2

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS
MILLSTONE POWER STATION UNIT 2**

In a letter dated September 14, 2004, the Nuclear Regulatory Commission (NRC) staff requested additional information to complete its review of Dominion's response to NRC Bulletin 2003-01. In a letter dated November 10, 2004, Dominion provided its response for Millstone Power Station Units 2 and 3. In a letter dated April 8, 2005, the NRC further requested additional information to complete its review for Millstone Power Station Units 2 and 3. The response to the request for additional information for Millstone Power Station Unit 2 is provided below.

NRC Requested Information

In an November 10, 2004, RAI response, Dominion Nuclear Connecticut, Inc. (Dominion) stated that the WOG recommendation was, "to implement some changes to CEN-152, Combustion Engineering Emergency Procedure Guidelines."

The RAI response also stated that the changes had been compared to the changes already made to the MP2 emergency operating procedures (EOPs), and that the strategy changes for CEN-152 were addressed in the MP2 changes with one exception: early termination of one containment spray train. You stated that the MP2 radiological analysis credits containment spray operation for two hours for iodine removal from the containment atmosphere, and that early termination of one train of containment spray would make the plant vulnerable to a subsequent single failure of the operating containment spray train (an unanalyzed condition). Although not implemented as an interim compensatory measure for Bulletin 2003-01, you stated that this action is being assessed for long-term consideration.

NRC Question 1

Dominion has not provided a schedule for completing this assessment. The WOG published WCAP-16204, "Evaluation of Potential ERG [emergency response guideline] Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)," in March 2004, and licensees have already had a full year in which to evaluate these proposed candidate operator actions (COAs). Compensatory measures such as those described in Bulletin 2003-01 were intended to be implemented on a timely basis in order to reduce the risks associated with potential sump blockage while evaluations to confirm compliance with the regulations could be completed. An evaluation schedule "consistent with

Generic Letter 2004-02 resolution" does not meet the intent of Bulletin 2003-01. Please provide a schedule for evaluating these COAs (which is consistent with the intent of Bulletin 2003-01), as the staff expects a valid technical basis for any decisions not to implement these COAs.

Dominion Response

As discussed in Dominion letter 04-582 dated November 10, 2004, early termination of one containment spray train would make the plant vulnerable to a subsequent single failure of the operating train that would place the plant in an unanalyzed condition. Further it was identified that this change would adversely affect the design basis LOCA radiological analysis. Since implementation of this COA would potentially significantly increase the radiological dose to the public, it was judged that this negative impact outweighed any potential benefit in sump NPSH. Thus, Dominion has not implemented this COA as a compensatory measure.

Because of the negative aspects of this type of change, it may not even represent an acceptable approach for resolution of the sump debris blockage issue. It may, however, be possible to implement other solutions including installation of an engineered sump screen or an active screen that will resolve the issue without adversely impacting offsite dose following a LOCA. These options may be preferable to early termination of containment spray. However, termination of one spray train continues to represent one possible solution to be considered for responding to Generic Letter 2004-02. Dominion committed to complete the evaluation of available options and the selection of a solution by September 1, 2005, in its letter 04-576 dated March 4, 2005.

In addition to early termination of one spray train discussed above, Dominion had evaluated Volumes 1 and 3 of WCAP-16204, Revision 1, for applicability to Millstone Unit 2. Volume 1 of the WCAP report documents the Westinghouse Owners Group (WOG) evaluation of 11 Candidate Operator Actions (COAs) for short-term implementation to reduce the risk from sump blockage. The participating utilities reviewed the COAs to determine if any warranted a generic recommendation for implementation in the short term. Some COAs apply only to a limited number of plants. Others require license amendments for implementation and were not considered short-term compensatory measures. Some could increase the potential for core damage and were not recommended for implementation. Volume 1 includes two recommendations in the Executive Summary that "should be implemented as generic EPG modifications": preparation for refill of the RWST (COA A5) and response to loss of recirculation flow (COA 9). Both of these recommendations appear in the guidance that was

provided in the generic revision to CEN-152, which was included in Volume 3 of WCAP-16204, Revision 1. The intent of the revisions to CEN-152 was to realize the risk benefit that was described in LA-UR-02-7562, "The Impact of Recovery from Debris-Induced Loss of ECCS Recirculation on PWR Core Damage Frequency," associated with recovery from loss of recirculation due to sump blockage.

As discussed in Dominion letter 04-582 dated November 10, 2004, in response to Bulletin 2003-01, Dominion promptly took appropriate actions to reduce the risk from sump blockage following a LOCA. Dominion developed enhancements to the Millstone Unit 2 Emergency Operating Procedures (EOPs) in parallel with the WOG activities and implemented plant-specific EOP changes in March 2004. When the WOG finalized the revisions to CEN-152 and released it for use in March 2004, it was only necessary for Dominion to confirm that the Millstone Unit 2 plant-specific EOP changes were consistent with the Revisions to CEN-152. In the letter dated November 10, 2004, Dominion confirmed that the Millstone Unit 2 EOPs had incorporated the recommendations in the revision to CEN-152 with the exception noted above.

Finally, as discussed in the response to NRC Question 2 below, Dominion has reviewed the eleven COAs and determined that only COAs A7 and A8, in addition to COAs A5 and A9, should be implemented as short-term compensatory measures.

NRC Question 2

The Dominion approach implies that the entirety of Volume I and Appendix A of Volume I of WCAP-16204, Revision 1, was not considered for its usefulness in further reducing risk from a sump clogging event. Please verify that the 11 COAs evaluated in Volume I of WCAP-16204, Revision 1 are included in the CEN-152 actual MP2 changes. Also please discuss the plant-specific evaluations and verifications performed to justify the applicability and usability of the generic CEN-152 changes for MP2. Provide technical justification for any plant-specific deviations which do not implement any of the 11 COAs.

Dominion Response

A separate response is provided to the three subparts of this question.

NRC Question 2a

Please verify that the 11 COAs evaluated in Volume I of WCAP-16204, Revision 1 are included in the CEN-152 actual MP2 changes.

Dominion Response

The 11 Candidate Operator Actions in Volume 1 of WCAP-16204, Revision 1, are not included in the WOG revision to CEN-152 documented in Volume 3 of WCAP-16204, Revision 1. As discussed in the response to NRC Question 1 above, the WOG determined that only two COAs warranted generic guidance: preparation for refill of the RWST (COA A5) and response to loss of recirculation flow (COA A9). Both of these recommendations appear in the revision to CEN-152. In addition, Volume 1 recommended in COA-A7, the EPG terminology and usage of "controlled cooldown and a rapid cooldown" be clarified and EPG changes incorporated. Dominion has concluded that the intent of the clarification was already provided in an existing "Note" in Millstone Unit 2 EOP 2532. Volume 1 also recommended in COA A8 that operator guidance be developed on symptoms and identification of sump blockage. As discussed in Dominion letter 04-582 dated November 10, 2004, changes were made to the Millstone Unit 2 EOP 2532 "Loss of Coolant Accident" to add monitoring of stable high pressure safety injection pump discharge pressure and adequate suction pressure as indicators of adequate post-sump recirculation HPSI flow. The EOP already included monitoring of flow and stable motor current. The remaining COAs required plant-specific evaluations to assess the impact on the plant design and licensing basis. The evaluation of each COA for Millstone Unit 2 is provided in Table 2.

NRC Question 2b

Also please discuss the plant-specific evaluations and verifications performed to justify the applicability and usability of the generic CEN-152 changes for MP2.

Dominion Response

As discussed in Dominion letter 04-582 dated November 10, 2004, the EOP changes which became effective March 31, 2004, provided additional guidance for addressing the potential for debris blockage of the sump. These procedure changes were demonstrated to be effective through simulator validation. Subsequent to the implementation of these EOP changes, the WOG published Volume 3 of WCAP-16204, providing revisions to CEN-152 to address the implementation of COAs A5 and A9. The changes to CEN-152 were compared to the changes made to the Millstone Unit 2 EOPs. With the exception discussed in NRC Question 1 above, it was concluded that the strategy changes incorporated into CEN-152 were addressed in the Millstone Unit 2 EOPs.

NRC Question 2c

Provide technical justification for any plant-specific deviations which do not implement any of the 11 COAs.

Dominion Response

Table 2 below summarizes the Dominion evaluation of each COA from Volume 1 of WCAP-16204, Revision 1, for Millstone Unit 2. Some of the COAs involve manually securing an operating containment spray or safety injection pump once it is established that all trains are running and other criteria are satisfied. Dominion did not implement pre-emptive measures for four reasons. First, this type of change has the potential for significantly increasing the risk of core damage and increasing the radiological dose to the public. It was judged that this negative impact outweighs any potential benefit in sump NPSH. Second, the Millstone Unit 2 licensing bases analyses assume that a minimum of one train of safety injection and one train of containment spray operate continuously to satisfy accident analysis acceptance criteria. Therefore, securing a safety injection or containment spray pump creates a new single failure that requires analysis and a potential licensing basis change. Interim compensatory measures should be short-term actions that are within a plant's licensing basis. Third, Dominion believes that such pre-emptive action deviates from the symptom-based response strategy of the EOPs and represents a change in procedure performance expectations for plant operators. Finally, the sump monitoring and recovery actions implemented at Millstone Unit 2 in March 2004 provided sufficient risk reduction. Dominion concurs with the WOG that only COAs A5, A7, A8, and A9 should be implemented as short-term compensatory measures.

NRC Question 3

You stated that a plant-specific calculation has been performed to quantify the benefits of implementing the EOP changes, and that the core damage frequency is reduced by a factor of 12 when the analysis considered the effect of recovery by operator actions. The NRC staff has stated that licensees may use quantitative data to justify not taking an interim compensatory measure. Based on Dominion's RAI response, it appears that the licensee may be relying on this quantitative risk analyses to justify not implementing certain COAs. However, due to the level of detail in the RAI response, it is not clear that this is the case. Therefore, if Dominion is relying on a quantitative risk analyses to justify not implementing certain COAs, please provide the staff with a listing of the COAs not being implemented and a detailed discussion of the quantitative analysis and results which formulate the technical basis for this decision.

Dominion Response

As discussed in the responses provided above, Dominion has used both the WOG evaluation of the COAs and its own plant specific evaluation of the COAs in determining the short term compensatory measures to be implemented. This evaluation is summarized in Table 2 below. Specific quantitative risk analyses were not developed or used in the evaluations and decision making for implementing the COAs. However, after the identified compensatory measures were implemented, a quantitative risk evaluation was performed to confirm that the implemented changes did indeed achieve a significant risk reduction. This was discussed in Dominion letter 04-582 dated November 10, 2004.

Table 2
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 2 Evaluation
A1A. Operator Action to Secure One Spray Pump	Implementation of this step is recommended for plants with containment fan coolers capable of removing significant heat loads	This COA was not implemented. For Millstone 2, continuous operation for two hours of the containment spray system is credited for removing iodine from the containment atmosphere and for ensuring that the containment temperature remains below the qualification requirements for safety related equipment inside containment. Since deliberate manual securing of one spray pump is not considered a "failure" in the licensing basis, analysis is required to show acceptable consequences with a failure of the remaining running containment spray pump. This COA was determined to likely result in an increase in offsite dose. It was judged that the negative impact of potentially increasing the radiological dose to the public outweighs the potential benefit in sump NPSH. Thus, it was concluded that this Candidate Operator Action would not be implemented in the short term. However, early termination of containment spray in combination with other potential hardware changes might result in a positive benefit and therefore will be considered as a possible long-term resolution. The plans for long term resolution will be provided by September 2005.

Table 2
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 2 Evaluation
A1B Operator Action to Secure Both Spray Pumps	Implementation of this step is only recommended for plants with containment fan coolers that can remove 100% of the decay heat load when spray is stopped and spray is not required for iodine removal or pH control.	This COA was not implemented. For Millstone 2, continuous operation containment spray system for two hours is credited for removing iodine from the containment atmosphere and for ensuring that the containment temperature remains below the qualification requirements for safety related equipment inside containment. Termination of spray will result in an increase in offsite dose. It was judged that the negative impact of potentially increasing the radiological dose to the public outweighs the potential benefit in sump NPSH. Thus, it was concluded that this Candidate Operator Action would not be implemented in the short term. However, early termination of containment spray in combination with other hardware changes might result in a positive benefit and therefore will be considered as a possible long-term resolution. The plans for long term resolution will be provided by September 2005.
A2. Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation.	Implementation of this operator action is recommended only for plants that: • Have margin in their containment sump NPSH calculation • Can secure one injection train • Can secure one or both spray pumps • Can refill RWST	This COA was not implemented. The current design basis post-LOCA NPSH analysis has determined that the available margin is approximately 0.3 feet. This margin was considered too small to support early switchover.

Table 2
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 2 Evaluation
A3. Terminate One Train of HPSI/High-Head Safety Injection After Recirculation Alignment	Plant specific evaluation	As stated in WCAP-16204, deliberate manual securing of one HPSI train is not considered a "failure." Thus, analysis is required to show acceptable consequences with a failure of the remaining running train after manually stopping one HPSI train. This would mean an interruption of core flow until the operator can start the standby HPSI pumps. This can result in a significant increase in peak clad temperature and consequently a significant increase in the radiological dose to the public. It was judged that this negative impact outweighs any potential benefit in sump NPSH. Thus, this Candidate Operator Action was not implemented. It is noted, however, that EOP changes have been made that allow throttling of HPSI flow to the minimum needed for decay heat removal, as described in Dominion letter 04-582 dated November 10, 2004.
A4. Early Termination of one LPSI/RHR pump Prior to Recirculation Alignment	Preliminary indications show stopping one LPSI pump before recirculation may result in core damage and therefore is not risk beneficial.	This COA was not implemented. Deliberate manual securing of one LPSI/RHR pump is not considered a "failure." Thus, analysis is required to show acceptable consequences with a failure of the remaining running train after manually stopping one LPSI/RHR train. This would mean an interruption of LPSI/RHR until the operator can start the standby LPSI/RHR pumps. This can potentially result in a significant increase in peak clad temperature and consequently a significant increase in the radiological dose to the public. It was judged that this negative impact outweighs any potential benefit in sump NPSH.

Table 2
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 2 Evaluation
A5. Refill of Refueling Water Storage Tank	Implementation of ERG/EPG changes to initiate early action to line up to refill the RWST or bypass it to support using an alternate makeup source, if needed, is generally recommended.	As discussed in Dominion letter 04-582 dated November 10, 2004 this COA was incorporated into the Millstone Unit 2 EOPs.
A6. Inject More Than One RWST Volume From a Refilled RWST or by Bypassing the RWST	Incorporating new guidance or modifying existing ERG/EPG guidance to inject water into the RCS from a refilled RWST or from an alternate source bypassing the RWST will likely be addressed differently between the ERG/EPG and the SAMGs. This action would only be taken after aligning for recirculation and a subsequent loss of recirculation capability due to sump blockage. This is	As discussed in Dominion letter 04-582, dated November 10, 2004, the possibility of re-filling the RWST is included in the Millstone Unit 2 EOPs. The EOPs require direction from the TSC for the method for refilling the RWST and injecting into the RCS. Similar guidance for refilling the RWST and injecting into the RCS is provided in the SAMGs. These actions are coordinated by the TSC.

Table 2 Evaluation of Westinghouse Owners Group Candidate Operator Actions		
Candidate Operator Action	**WOG Recommendation**	**Millstone Unit 2 Evaluation**
	clearly a beyond design basis situation. Therefore, these actions must be coordinated by the Station Emergency Response Organization's Technical Support Center (TSC) and in accordance with the SAMGs.	
A7. Provide More Aggressive Cooldown and Depressurization Following a Small Break LOCA.	It is recommended that the EPG terminology and usage of "controlled cooldown" and "rapid cooldown" be clarified and EPG changes incorporated.	This interpretation of cooldown was already incorporated into the Millstone Unit 2 EOPs through Notes in EOP 2532.
A8. Provide Guidance on Symptoms and Identification of Containment Sump Blockage.	Plant specific evaluation.	As discussed in Dominion letter 04-582 dated November 10, 2004 this COA was incorporated into the Millstone Unit 2 EOPs.

Table 2
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 2 Evaluation
A9 Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation.	Development of generic guidance to sump blockage.	As discussed in Dominion letter 04-582 dated November 10, 2004 this COA was incorporated into the Millstone Unit 2 EOPs.
A10. Early Termination of One Train of HPSI/High-Head Injection Prior to Recirculation Alignment	Securing one HPSI pump before transfer to recirculation is not considered risk beneficial due to the risk of core damage upon single failure loss of the one operating HPSI pump during a small break LOCA.	This COA was not implemented. Deliberate manual securing of one HPSI train is not considered a "failure." Thus, analysis is required to show acceptable consequences with a failure of the remaining running train after manually stopping one HPSI train. This would mean an interruption of HPSI until the operator can start the standby HPSI pumps. This can potentially result in a significant increase in peak clad temperature and consequently a significant increase in radiological dose to the public. It was judged that this negative impact outweighs any potential benefit in sump NPSH.
A11. Prevent or Delay Containment Spray for Small Break LOCAs in Ice Condenser Plants	Implementation is not recommended as a change to the ERGs and no further generic work is required.	This COA is not applicable to the Millstone Unit 2 which has a large dry containment design.

ATTACHMENT 3

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION BULLETIN 2003-01, POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS MILLSTONE POWER STATION UNIT 3

In a letter dated September 14, 2004, the Nuclear Regulatory Commission (NRC) staff requested additional information to complete its review of Dominion's response to NRC Bulletin 2003-01. In a letter dated November 10, 2004, Dominion provided its response for Millstone Power Station Units 2 and 3. In a letter dated April 8, 2005, the NRC further requested additional information to complete its review for Millstone Power Station Units 2 and 3. The response to the request for additional information for Millstone Power Station Unit 3 is provided below.

NRC Requested Information

In a November 10, 2004, RAI response, Dominion stated that the WOG recommendation was, "to implement the Sump Blockage Control Room Guideline (SBCRG) documented in Volume 2 to WCAP-16204, Revision 1 as an interim compensatory action to reduce the risk associated with sump blockage."

The RAI response also stated that, "Dominion has compared the SBCRG to the Millstone Unit 3 plant-specific EOP changes that were implemented in March 2004 and has concluded that the Millstone Unit 3 EOP changes encompass the strategies provided in the SBCRG."

The Dominion approach implies that the entirety of Volume I and Appendix A of Volume I of WCAP-16204, Revision 1, was not considered for its usefulness in further reducing risk from a sump clogging event. Although the 11 COAs of Volume I may or may not be included in the SBCRG, may or may not be applicable for the MP3 design, and may or may not be risk beneficial for MP3, it is incumbent upon the licensee to provide technical justifications for not implementing them.

Dominion Response

Dominion had evaluated Volumes 1 and 2 of WCAP-16204, Revision 1, for applicability to Millstone Unit 3. Volume 1 of the WCAP report documents the Westinghouse Owners Group (WOG) evaluation of 11 Candidate Operator Actions (COAs) for short-term implementation to reduce the risk from sump blockage. The participating utilities reviewed the COAs to determine if any warranted a generic recommendation for implementation in the short term. Some COAs apply only to a limited number of plants. Others require license

amendments for implementation and were not considered short-term compensatory measures. Some could increase the potential for core damage and were not recommended for implementation. Volume 1 includes two recommendations in the Executive Summary that "should be implemented as generic ERG modifications": preparation for refill of the RWST (COA A5) and response to loss of recirculation flow (COA A9). Both of these recommendations appear in the guidance that was provided in the generic Sump Blockage Control Room Guidance (SBCRG), which was provided in Volume 2 of WCAP-16204, Revision 1. The intent of the SBCRG was to realize the risk benefit that was described in LA-UR-02-7562, "The Impact of Recovery from Debris-Induced Loss of ECCS Recirculation on PWR Core Damage Frequency," associated with recovery from loss of recirculation due to sump blockage.

As discussed in Dominion letter 04-582 dated November 10, 2004, in response to Bulletin 2003-01, Dominion promptly took appropriate actions to reduce the risk from sump blockage following a LOCA. Dominion developed enhancements to Millstone Unit 3 Emergency Operating Procedures (EOPs) in parallel with the WOG activities and implemented plant-specific EOP changes in March 2004. When the WOG finalized the SBCRG and released it for use in March 2004, it was only necessary for Dominion to confirm that the Millstone Unit 3 plant-specific EOP changes were consistent with the SBCRG. In the letter dated November 10, 2004, Dominion confirmed that the Millstone Unit 3 EOPs had incorporated the seven major actions from the WOG SBCRG.

Finally as discussed in the response to NRC Question 1 below, Dominion has reviewed the eleven COAs and determined that only COA A8 in addition to COAs A5 and A9 should be implemented as short-term compensatory measures.

NRC Question 1

Please provide information to verify that the 11 COAs evaluated in Volume I of WCAP-16204, Revision 1 are included in the SBCRG. Also please discuss the plant-specific evaluations and verifications performed to justify the applicability and usability of the generic SBCRG for MP3. Provide technical justification for any plant-specific deviations which do not implement any of the 11 COAs.

Dominion Response

A separate response is provided to the three subparts of this question.

NRC Question 1a

Please provide information to verify that the 11 COAs evaluated in Volume I of WCAP-16204, Revision 1 are included in the SBCRG.

Dominion Response

The 11 Candidate Operator Actions in Volume 1 of WCAP-16204, Revision 1, are not included in the WOG SBCRG documented in Volume 2 of WCAP-16204, Revision 1. As discussed in the response above, the WOG determined that only two COAs warranted generic guidance: preparation for refill of the RWST (COA A5) and response to loss of recirculation flow (COA A9). Both of these recommendations appear in the generic SBCRG. In addition, Volume 1 recommended in COA A8 that operator guidance be developed on symptoms and identification of sump blockage. Millstone Unit 3 implemented changes in March 2004 to monitor key sump performance indicators for blockage, effectively implementing COA A8. The remaining COAs required plant-specific evaluations to assess the impact on the plant design and licensing basis. The evaluation of each COA for Millstone Unit 3 is provided in Table 3.

NRC Question 1b

Also please discuss the plant-specific evaluations and verifications performed to justify the applicability and usability of the generic SBCRG for MP3.

Dominion Response

In its letter 04-582 to the NRC dated November 10, 2004, Dominion identified that the SBCRG was not implemented at Millstone Unit 3 as a stand-alone procedure. The Millstone Unit 3 EOPs were modified in March 2004 to provide the operators with recovery instructions for a loss of recirculation due to sump blockage. About the same time that the plant-specific EOP changes were implemented, the WOG published the SBCRG in Volume 2 of WCAP-16204, Revision 1. This document identified seven major actions to perform in response to loss of recirculation from containment sump clogging in a Westinghouse plant with a large dry containment. Dominion had monitored the development of the SBCRG to ensure that the March 2004 EOP changes implemented at Millstone Unit 3 would incorporate all seven major actions.

Dominion reviewed the SBCRG and concluded that the revised Millstone Unit 3 plant-specific EOPs have incorporated all of the seven major functions. Therefore, the intent of the SBCRG was completely implemented at Millstone Unit 3 before the SBCRG was fully available. The EOP changes were implemented using the plant procedure change process, which required plant-

specific simulator validations and change justifications under the 10 CFR 50.59 process. The plant-specific EOP changes did not change the progression or operator response for any design basis accident. The EOPs provide streamlined instructions for operator monitoring of key sump performance parameters and a direct path to alternate core cooling if all emergency recirculation is lost.

NRC Question 1c

Provide technical justification for any plant-specific deviations which do not implement any of the 11 COAs.

Dominion Response

Table 3 summarizes the Dominion evaluation of each COA from Volume 1 of WCAP-16204, Revision 1, for Millstone Unit 3. Some of the COAs involve manually securing an operating containment spray or safety injection pump once it is established that all trains are running and other criteria are satisfied. Dominion did not implement pre-emptive measures for four reasons. First, this type of change has the potential for significantly increasing the risk of core damage and increasing the radiological dose to the public. It was judged that this negative impact outweighs any potential benefit in sump NPSH. Second, the Millstone Unit 3 licensing bases analyses assume that a minimum of one train of safety injection and one train of containment spray operate continuously to satisfy accident analysis acceptance criteria. Therefore, securing a safety injection or containment spray pump creates a new single failure that requires analysis and a potential licensing basis change. Interim compensatory measures should be short-term actions that are within a plant's licensing basis. Third, Dominion believes that such pre-emptive action deviates from the symptom-based response strategy of the EOPs and represents a change in procedure performance expectations for plant operators. Finally, the sump monitoring and recovery actions implemented at Millstone Unit 3 in March 2004 provided sufficient risk reduction. Dominion concurs with the WOG that only COAs A5, A8, and A9 should be implemented as short-term compensatory measures.

NRC Question 2

You stated that a plant-specific calculation has been performed to quantify the benefits of implementing the EOP changes, and that the core damage frequency is reduced by a factor of 29 when the analysis considered the effect of recovery by operator actions. The staff has stated that licensees may use quantitative data to justify not taking an interim compensatory measure. Based on Dominion's RAI response, it appears that you may be relying on this quantitative risk analyses to justify not implementing certain COAs. However, due to the level of detail in the RAI response, it is not clear that this is the case. Therefore, if

Dominion is relying on a quantitative risk analyses to justify not implementing certain COAs, please provide the staff with a listing of the COAs not being implemented and a detailed discussion of the quantitative analysis and results which formulate the technical basis for this decision.

Dominion Response

As discussed in the responses provided above, Dominion has used both the WOG evaluation of the COAs and its own plant specific evaluation of the COAs in determining the short term compensatory measures to be implemented. This evaluation is summarized in Table 3 below. Specific quantitative risk analyses were not developed or used in the evaluations and decision making for implementing the COAs. However, after the identified compensatory measures were implemented, a quantitative risk evaluation was performed to confirm that the implemented changes did indeed achieve a significant risk reduction. This was discussed in Dominion letter 04-582 dated November 10, 2004.

Table 3
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 3 Evaluation
A1A Westinghouse Plants Operator Action to Secure One Spray Pump	Implementation of this step is recommended for plants with containment fan coolers capable of removing significant heat loads	This COA was not implemented. For Millstone 3, the containment fan coolers are located in the basement of the containment and will be flooded as the containment fills with water. As such, the containment fan coolers would not be available to mitigate a LOCA inside containment. Continuous operation of the containment spray system is credited in the radiological analysis for the design basis LOCA. Since deliberate manual securing of one spray pump is not considered a "failure," analysis is required to show acceptable consequences with a failure of the remaining running spray pump. This would result in a significant increase in offsite dose. It was judged that this negative impact outweighed any potential benefit in sump NPSH. It is noted that in the event of a failure of recirculation, the MPS3 EOPs do contain steps to terminate containment sprays if they are not needed for containment integrity.
A1B Operator Action to Secure Both Spray Pumps	Implementation of this step is only recommended for plants with containment fan coolers that can remove 100% of the decay heat load when spray is stopped and spray is not required for iodine removal or pH control.	This COA was not implemented. For Millstone 3, the containment fan coolers are located in the basement of the containment and will be flooded as the containment fills with water. As such, the containment fan coolers would not be available to mitigate a LOCA inside containment. Without containment spray, there will be a significant increase in containment pressure and offsite dose. It was judged that this negative impact outweighed any potential benefit in sump NPSH. It is noted that in the event of a failure of recirculation, the MPS3 EOPs do contain steps to terminate containment sprays if they are not needed for containment integrity.

Table 3
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 3 Evaluation
A2. Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation.	Implementation of this operator action is recommended only for plants that: • Have margin in their containment sump NPSH calculation • Have the ability to secure one injection train • Have the ability to secure one or both spray pumps • Can refill RWST	This COA is incompatible with the Millstone Unit 3 containment heat removal design and was not implemented. The containment recirculation spray pumps start approximately 11 minutes after the Containment Depressurization Actuation signal. At the time when the recirculation pumps start, only a small fraction of the RWST inventory has been injected and there is little or no water on the containment floor. Thus, it is judged that the available margin is too small to support early switchover of ECCS injection from the RWST to sump recirculation.
A3. Terminate One Train of Safety Injection After Recirculation Alignment	Plant specific evaluation	As stated in WCAP-16204, deliberate manual securing of one SI train is not considered a "failure." Thus, analysis is required to show acceptable consequences with a failure of the remaining running train after manually stopping one SI train. This would mean an interruption of SI flow until the operator can start the standby SI pumps. This can potentially result in a significant increase in peak clad temperature and consequently a significant increase in the radiological dose to the public. It was judged that this negative impact outweighed any potential benefit in sump NPSH. Thus, this Candidate Operator Action was not implemented.

Table 3
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 3 Evaluation
A4. Early Termination of one LPSI/RHR pump Prior to Recirculation Alignment	Preliminary indications show stopping one LPSI pump before recirculation may result in core damage and therefore is not risk beneficial.	This COA was prepared for CE plants and is not applicable to Millstone Unit 3.
A5. Refill of Refueling Water Storage Tank	Implementation of ERG/EPG changes to initiate early action to line up to refill the RWST or bypass it to support using an alternate makeup source, if needed, is generally recommended.	As discussed in Dominion letter 04-582 dated November 10, 2004 this COA was incorporated into the Millstone Unit 3 EOPs.

Table 3
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 3 Evaluation
A6. Inject More Than One RWST Volume From a Refilled RWST or by Bypassing the RWST	Incorporating new guidance or modifying existing ERG/EPG guidance to inject water into the RCS from a refilled RWST or from an alternate source bypassing the RWST will likely be addressed differently between the ERG/EPG and the SAMGs. This action would only be taken after aligning for recirculation and a subsequent loss of recirculation capability due to sump blockage. This is clearly a beyond design basis situation. Therefore, these actions must be coordinated by the Station Emergency Response Organization's Technical Support Center (TSC) and in accordance with the SAMGs.	As discussed in Dominion letter 04-582, dated November 10, 2004, the possibility of re-filling the RWST from the spent fuel pool or providing blended flow makeup from the Chemical Volume and Control System is included in the Millstone Unit 3 EOPs. The EOPs require direction from the TSC for injecting using these alternate sources. Guidance for refilling the RWST and guidance for injecting into the RCS is provided both in the EOPs and the SAMGs. These actions are coordinated by the TSC.
A7. Provide More Aggressive Cooldown and Depressurization Following a Small Break LOCA.	The Westinghouse Emergency Response Guidelines already address maximizing the cooldown rate up to the Technical Specification limit.	The Millstone Unit 3 EOPs are consistent with the WOG ERGs and include guidance for aggressive cooldown and depressurization. No changes were necessary.

Table 3
Evaluation of Westinghouse Owners Group
Candidate Operator Actions

Candidate Operator Action	WOG Recommendation	Millstone Unit 3 Evaluation
A8. Provide Guidance on Symptoms and Identification of Containment Sump Blockage.	In general, the proposed change is advantageous to most plants.	As discussed in Dominion letter 04-582 dated November 10, 2004, this COA was incorporated into the Millstone Unit 3 EOPs.
A9 Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation.	Development of generic guidance to sump blockage.	As discussed in Dominion letter 04-582 dated November 10, 2004, this COA was incorporated into the Millstone Unit 3 EOPs.
A10. Early Termination of One Train of HPSI/High-Head Injection Prior to Recirculation Alignment	Securing one HPSI pump before transfer to recirculation is not considered risk beneficial due to the risk of core damage upon single failure loss of the one operating HPSI pump during a small break LOCA.	This COA was prepared for CE plants and is not applicable to Millstone Unit 3.
11. Prevent or Delay Containment Spray for Small Break LOCAs in Ice Condenser Plants	Implementation is not recommended as a change to the ERGs and no further generic work is required.	This COA is not applicable to the Millstone Unit 3, which has a large dry containment design.